

## matRad User Meeting & Hackathon: Feb. 17 – 21, 2025 (as of Feb. 7<sup>th</sup>, 2025)

### Part 1: matRad User Meeting: Feb. 17 & 18, 2025

#### Mon. Feb. 17, 2025: Introduction and Project Pitches

Seminar Room: K1/K2, first floor of the Communication Center  
(see website on how to get there)

Time	Session	Speaker / Moderator
9.00 – 9.30am	<b>Registration and Welcome Coffee and Snacks</b>	
9.30 – 9.45am	<b>Welcome Address</b> Introduction by organizers, event objectives, schedule overview.	Niklas Wahl Amit Bennan
9.45 – 10.30am	<b>10 years of matRad</b>	Niklas Wahl
10.30 – 11.15am	<b>User Highlight: Particle Therapy MasterClass</b>	<b>Dr. Yiota Foka</b>
11.15am – 12.00pm	<b>User Highlight: Joint Treatment Planning</b>	<b>Prof. Jan Unkelbach</b>
12.00 – 1.00pm	<b>Lunch Break with Group Photo</b>	
1.00 – 2.00pm	<b>Project Pitch Session 1</b> <ul style="list-style-type: none"> <li>- <u>L. Bucher</u>: 3DSlicer Integration</li> <li>- <u>J. Leitao</u>: Using matRad and SlicerRT to Teach Radiotherapy Treatment Planning to Engineering Students</li> <li>- <u>T. Becher</u>: Multi-criteria tools for matRad (and a quick glance at "suppy")</li> <li>- <u>R. Cristoforetti</u>: A new system for complex planning with multiple quantities</li> <li>- <u>S. Facchiano</u>: Nano-dosimetric treatment planning</li> <li>- <u>A. Bennan</u>: LET-based photon-/proton joint treatment plan optimization</li> </ul>	Moderator: Niklas Wahl
2.00 – 3.15pm	<b>matRad QA</b> Discussion of questions, wishes & ideas from the community	Moderator: Niklas Wahl
3.15 – 3.45pm	<b>Coffee Break with Demonstrators</b>	
3.45 – 4.25pm	<b>User Highlight: Advanced Optimization Approaches</b>	<b>Dr. Vicki Taasti</b>
4.25 – 5.25pm	<b>User Highlight: Multi-criteria Optimization</b>	<b>Dr. Philipp Süß</b>
7:00pm	<b>Dinner and Informal QA</b> Dinner at Restaurant "Zum Achter": <a href="https://www.zum-achter.com/">https://www.zum-achter.com/</a> Google Maps: <a href="https://maps.app.goo.gl/Q7b2Njmvj8p3uaGh8">https://maps.app.goo.gl/Q7b2Njmvj8p3uaGh8</a> Thanks to our DFG Funds, speakers and participants are invited for dinner.	

**Tue. Feb. 18, 2025:** Talks and Finalizing Teams

**9.00am – 12.00 (noon):** Lecture Hall, ground floor of the Communication Center

Time	Session	Speaker / Moderator
8.45 – 9.00am	<b>Welcome Coffee</b>	
9.00 – 09.45am	<b>User Highlight: VMAT dose calculation and planning</b>	<b>Eric Christiansen, PhD</b>
9.45 – 10.15am	<b>User Highlight: VHEE treatment planning</b>	<b>Fabio D’Andrea</b>
10.15 – 10.45am	<b>Coffee Break with Demonstrators</b>	
10.45am – 12.00 pm	<b>Project Pitch Session 2</b> <ul style="list-style-type: none"> <li>- <u>L. Ermenaux</u>: Very High Energy Electrons dose calculation</li> <li>- <u>A. Neishabouri</u>: Development of a fully AI-driven dose calculation engine for proton therapy</li> <li>- <u>L. Sommer</u>: Mixed neutron/photon dose calculation with pencil-beam and MCNP</li> <li>- <u>P. Stammer</u>: Photon dose calculation interface to TOPAS MC</li> <li>- <u>M. Abuladze</u>: comparison of the proton therapy doses obtained with the Geant4 and matRAD</li> <li>- <u>J. Stolzenberg</u>: Implementation of lungmodulation effects in the treatment planning system matRad</li> <li>- <u>P. Cabrales</u>: Proton therapy dose verification with PET (PROTOTWIN-PET)</li> </ul>	Moderator: Amit Bennan
12.00 – 1.00pm	<b>Lunch Break</b>	

**1.00 – 5.15pm:** Seminar Room: K1/K2, first floor of the Communication Center

1.00 – 1.45pm	<b>User Highlight: Robust treatment planning for photon IMRT</b>	<b>Dr. Gonzalo Cabal</b>
1.45 – 2.30 pm	<b>User Highlight: Toward a Temporally-aware, Biologically guided Treatment Design in Radiotherapy</b>	<b>Ali Ajdari, PhD</b>
2.30 – 3.30pm	<b>Project Pitch Session 3</b> <ul style="list-style-type: none"> <li>- <u>J. Hardt</u>: 4D dose calculation with TOPAS MC</li> <li>- <u>T. Ortkamp</u>: Outcome-based treatment planning</li> <li>- <u>V. Santiago</u>: (Bayesian) Deep-Learning for dose calculation with AI</li> <li>- <u>M. Lapaeva</u>: Evaluation of Synthetic CT Quality Using DVH Calculations</li> <li>- <u>G. Stanic</u>: From synthetic CTs through matRad to pyRadPlan</li> <li>- <u>F. Leininger</u>: Python interfaces and and native dose calculation in pyRadPlan</li> </ul>	Moderator: Amit Bennan
3.30 – 4.00pm	<b>Coffee Break with Demonstrators</b>	
4.00 – 5.00pm	<b>matRad Roadmap Discussion</b> Future of matRad (& pyRadPlan), potential Steering Committee	Moderator: Niklas Wahl
5.00 – 5.15pm	<b>Wrap-up &amp; Closing of the User Meeting</b>	Niklas Wahl Amit Bennan

## Part 2: Hackathon Feb. 19 – 21, 2025

Wed. Feb. 19, 2025: Coding Session and Q&A

Seminar Room: K1/K2, first floor of the Communication Center

Time	Session	Speaker / Groups
8.45 – 9.00am	<b>Welcome Coffee and Snacks</b>	
9.00 – 10.00am	<b>Hackathon Kick-Off</b>	Niklas Wahl
10.00am – 12.00pm	<b>Planning Session: Ideation &amp; Planning, Code Analysis</b> <ul style="list-style-type: none"> <li>Teams dive into their projects, analyse existing code, define hackathon plan</li> <li>matRad developers act as mentors to support</li> <li><i>coffee &amp; snacks available!</i></li> </ul>	Project Groups
12.00 – 1.00pm	<b>Lunch Break</b>	
1.00 – 1.30pm	<b>Q&amp;A Session</b> <ul style="list-style-type: none"> <li>General Q&amp;A Session with all participants</li> </ul>	Moderation: Amit Bennan All Participants
1.30 – 4.00pm	<b>Coding Session 1: Development Sprint</b> <ul style="list-style-type: none"> <li>Continued project development.</li> <li><i>coffee &amp; snacks available!</i></li> </ul>	Project Groups
4.00 – 5.00pm	<b>Check-In &amp; Project Updates</b> <ul style="list-style-type: none"> <li>Each team provides a 5-minute update on their progress and potential blockers.</li> </ul>	Moderation: Niklas Wahl All Participants
5.00pm – 7.00pm	<b>Optional Fun Activity: Coding Quiz</b>	

## Thu. Feb. 20, 2025: Coding Session and Q&A

Seminar Room: K1/K2, first floor of the Communication Center

Time	Session	Speaker / Groups
8.45 – 9.00am,	<b>Welcome Coffee and Snacks</b>	
9.00 – 10.00am	<b>Daily Kick-Off Meetings</b>	All Participants
10.00am – 12.00pm	<b>Coding Session 2: Development Sprint</b> <ul style="list-style-type: none"> <li>Continued project development.</li> <li><i>coffee &amp; snacks available!</i></li> </ul>	Project Groups
12.00 – 1.00pm	<b>Lunch Break</b>	
1.00 – 2.00pm	<b>Q&amp;A Session &amp; Discussion</b> <ul style="list-style-type: none"> <li>General Project Q&amp;A Session</li> <li>Discussion: Professional DevOps v. Research Software</li> </ul>	Moderation: Niklas Wahl All Participants
2.00 – 4.00pm	<b>Coding Session 3: Development Sprint</b> <ul style="list-style-type: none"> <li>Continued project development.</li> <li><i>coffee &amp; snacks available!</i></li> </ul>	Project Groups
4.00 – 5.00 pm	<b>Check-In &amp; Project Updates</b> <ul style="list-style-type: none"> <li>Each team provides a 5-minute update on their progress and potential blockers.</li> </ul>	Moderation: Amit Bennan All Participants
5.00 – 6.00 pm	<b>Coding Session 4: Debugging &amp; Testing</b> <ul style="list-style-type: none"> <li>Dedicated session for bug fixing and test definition</li> </ul>	Project Groups
6.00 – 8.00pm	<b>Optional Fun Activity: Pizza &amp; Code Golf</b>	

## Fri. Feb. 21, 2025: Final Coding, Presentations, and Awards

Seminar Room: K1/K2, first floor of the Communication Center

Time	Session	Speaker / Groups
8.45 – 9.00am	<b>Welcome Coffee and Snacks</b>	
9.00 – 10.00am	<b>Daily Kick-Off Meetings</b>	All Participants
10.00am – 12.00pm	<b>Coding Session 5: Final Sprint</b> <ul style="list-style-type: none"> <li>Continued project development</li> <li><i>coffee &amp; snacks available!</i></li> </ul>	Project Groups
12.00 – 1.00pm	<b>Lunch Break</b>	
1.00 – 2.00pm	<b>Final Check-In and QA session</b>	Moderation: Niklas Wahl
2.00 – 3.30pm	<b>Finalization and Presentation Preparation</b> <ul style="list-style-type: none"> <li>Continued project development</li> <li><i>coffee &amp; snacks available!</i></li> </ul>	Project Groups
3.30 – 4.00pm	<b>Final Presentations &amp; Demos</b> <ul style="list-style-type: none"> <li>Teams present their projects during the hackathon.</li> </ul>	Moderation: Amit Bennan Project Groups
4.00 – 4.30pm	<b>Award Ceremony</b>	Moderation: Niklas Wahl
4.30 – 5.00 pm	<b>Closing Remarks &amp; Group Photo</b>	Niklas Wahl, Amit Bennan
5.00pm	<b>Event Ends</b>	